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One of the important and expensive decisions confronting a healthcare organization involves facility life cycle management. Facility life cycle management decisions can involve the expenditure of millions of dollars of funds, and are a component of executing a healthcare organization's strategic plan. Poorly made facility life cycle management decisions may result in facilities that are unable to meet patient needs, or support the organization's strategic goals. Federal and civilian healthcare organizations have developed various methodologies to determine the type and size of healthcare facility to build. Some of these methodologies use numerous benchmarks and complex models to provide a recommended facility solution. The purpose of this study is to provide military health system leaders in the national capital area with a streamlined facility master planning model to be used when considering medical facility projects.

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U.S. Army-Baylor University
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Submitted in partial fulfillment of the requirements of the Healthcare Administration Curriculum

Master Planning Model for Healthcare Facility Design

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Most important to this study, however, has been the love and support I received from my wife Claudia, our son, and my family. My family's constant encouragement and understanding through these last few months have sustained me throughout this project. Without their support, this project would not have come together.

Abstract

One of the most important and expensive decisions confronting a healthcare organization involves facility life cycle management. Facility life cycle management decisions can involve the expenditure of millions of dollars of funds, and are a component of executing a healthcare organization's strategic plan. Poorly made facility life cycle management decisions may result in facilities that are unable to meet patient needs, or support the organization's strategic goals.

Federal and civilian healthcare organizations have developed various methodologies to determine the type and size of healthcare facility to build. Most importantly, facility management decisions must support the organization's strategic goals and business plans. Some of these methodologies use numerous benchmarks and complex models to provide a recommended facility solution.

The purpose of this study is to provide military health system leaders in the national capital area with a streamlined facility master planning model to be used when considering medical facility projects. As of the writing of this study, several significant medical military construction projects in the national capital area could utilize recommendations from this study to improve access to care for military health system beneficiaries.

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Introduction

The healthcare industry is a dynamic and competitive market. Healthcare organizations continually make business decisions that affect the quality, cost, and types of services provided to patients. One of the most significant and expensive decisions confronting a healthcare organization involves facility life cycle management. Facility life cycle management is a strategy that encompasses the planning, acquisition, sustainment / operation, and ultimate disposal of real property infrastructure (National Academy of Sciences, 2004). The objective of facility life cycle management is "to provide a reliable inventory of facilities that meets specific codes and standards, maintains accreditation, and affords the best possible healthcare environment for soldiers, family members, and retired beneficiaries" (U.S. Army, 2005, p. 44). The decision to build, renovate, or maintain a facility is not an easy one to make. "American hospitals spend millions of dollars per year on their facilities, and facilities development projects are usually the largest component of a hospital's capital budget" (Mitretek Healthcare, 2003, p. 4). According to the Government Accountability Office (GAO), in September 2000, the total value of federal facilities was estimated to be $328 billion, of which approximately $219 billion were defense-related facilities (National Academy of Sciences, 2004). In March 2004, the Army Medical Department (AMEDD) had 567 fixed facilities dispersed throughout the world valued at approximately $9 billion, and typically spends $175 million annually for facility life cycle management projects (Bond, 2004). Facility life cycle management is a critical aspect of military healthcare operations as these decisions require longer-term planning and funding sources, are typically expensive in nature, and directly affect the type and quality of care delivered to personnel across the globe.

The military health system (MHS) faces many of the same challenges affecting other healthcare organizations such as changing beneficiary population demographics, shrinking budgets, acquisition of expensive medical technologies, competing mission requirements, and competition for qualified healthcare providers (Shi & Singh, 2001). However, the MHS also has the fiduciary responsibility inherent to public financing of its operations. Therefore, decisions affecting military medical facility management are matters of public policy, and should be made to best support military missions and provide for the public good. According to the National Academy of Sciences, "Many departments and agencies have the wrong facilities, too many or not enough facilities, or facilities that are poorly sited to support their missions. Such facilities constitute a drain on the federal budget in actual costs and in foregone opportunities..." (National Academy of Sciences, 2004, p. 1). Military medical leaders must make well-informed facility management decisions in order to support and optimize mission accomplishment, while exercising prudent, financial decisions concerning public funding.

The purpose of this paper is to present a master planning model that facilitates optimal healthcare facility design decisions within the facility life cycle management process in order to best meet mission and patient needs. The focus of this paper concerns the facility design needs at DeWitt Army Community Hospital, located at Fort Belvoir, Virginia, within the context of the Walter Reed Healthcare System and the national capital area.

Background

National capital area (NCA) defined and NCA healthcare market.

The NCA is a unique and complex healthcare market for the MHS, and is defined as "a conglomerate of multiple overlying catchment areas within a 60-mile radius from the center of Washington, DC that roughly covers an 11,310 square mile area" (National Capital Area Multi-Service Market Manager Office [MSMMO], 2004, p. 4). Figure 1 graphically portrays the NCA multi-service market. The realignment of the TRICARE regions in 2004 placed the NCA in TRICARE North's region (Harben, 2004).

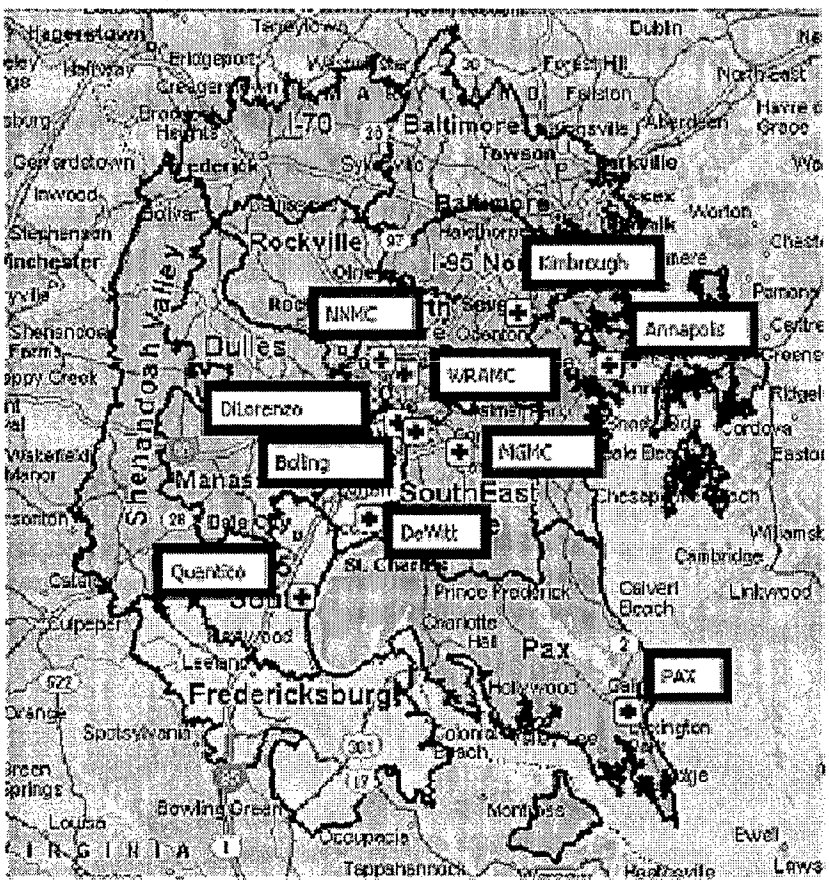

Figure 1. Map of the national capital area military health system

From "*FY-05 Business Plan*" by the National Capital Area Multi-Service Market Manager Office, 2004, p. 6.

The NCA is the only location in the United States in which three Service medical centers are located within a 15-mile radius. These medical centers are: the Army's Walter Reed Medical Center (WRAMC), the Navy's National Medical Center (NNMC) at Bethesda, and the Air Force's Malcolm Grow Medical Center (MGMC) at Andrews Air Force Base. These medical centers perform three primary missions: provide healthcare to patients, provide numerous graduate medical education (GME) residencies to military providers, and perform medical research. In fiscal year (FY) 2006, however, Malcolm Grow is planning on reducing services. This will subsequently affect the overall NCA GME program, and will likely cause a shift of workload to other MTFs in the national capital region.

In addition to the three medical centers, one other inpatient hospital, DeWitt Army Community Hospital, and 20 clinics with various clinical capabilities are dispersed throughout the region (MSMMO, 2004). The NCA military healthcare infrastructure is subsequently organized along service lines with multiple levels of subordinate healthcare systems. For instance, the Walter Reed Healthcare System is comprised of WRAMC, DeWitt Army Community Hospital (DACH) at Fort Belvoir, Kimbrough Ambulatory Care Center at Fort Meade, and the DiLorenzo TRICARE Clinic at the Pentagon. Furthermore, a secondary healthcare system is the DeWitt healthcare system comprised of the DeWitt hospital and three satellite healthcare clinics. These satellite clinics include two family health clinics located in Woodbridge and Fairfax, Virginia, and the Rader Army Health Clinic at Fort Myer, Virginia. Figure 2 graphically portrays the DeWitt Healthcare System.

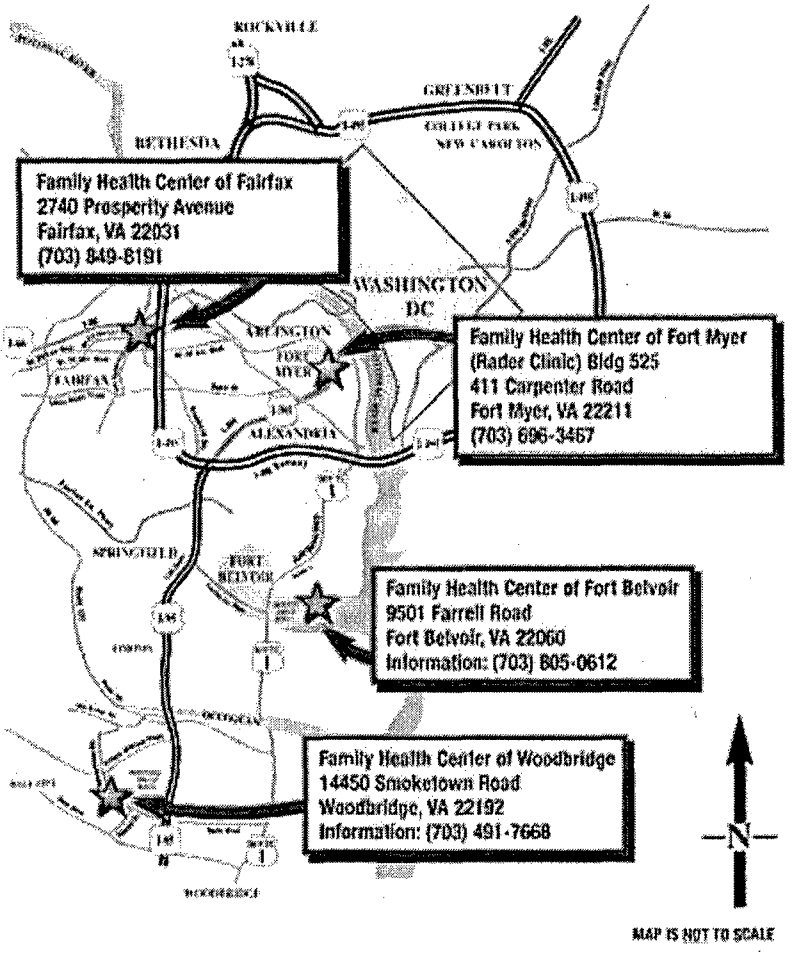

Figure 2. Map of the DeWitt Healthcare System

From DeWitt Healthcare Network (webpage), Fort Belvoir, VA.

Within the defined NCA radius, a robust Veteran's Health Administration infrastructure and multiple civilian healthcare systems coexist with the MHS facility infrastructure. The Veteran's Health Administration provides medical services to its eligible beneficiaries in the NCA through its Veterans Integrated Service Network (VISN) 5. VISN 5 is comprised of four medical centers and 15 community based outpatient clinics (Department of Veterans Affairs [DVA], n.d.). In addition to the major federal healthcare system infrastructure in the NCA, multiple civilian

health systems populate this region. Four noteworthy systems are the Johns Hopkins Healthcare System, Inova Health System, MedStar Health System, and Adventist Healthcare System.

As of June 2004, the MHS infrastructure in the NCA provided care to more than 281,000 enrolled beneficiaries. Of this total, more than 255,000 beneficiaries were TRICARE Prime enrollees, and more than 26,000 were TRICARE PLUS program beneficiaries empanelled to MTFs. This enrolled population represents approximately 61% of the total eligible population of 455,000 (MSMMO, 2004). The highest density of enrolled beneficiaries live south of Washington, D.C., in the Southwest Core and I-95 South corridor, and are enrolled to the DeWitt healthcare system, and the Naval Medical Clinic (NMCL) at Quantico, Virginia. When collecting enrollee residential information, active duty beneficiaries are mapped to their unit identification code (duty assignment) zip code, whereas all other beneficiaries are mapped to their residence zip code.

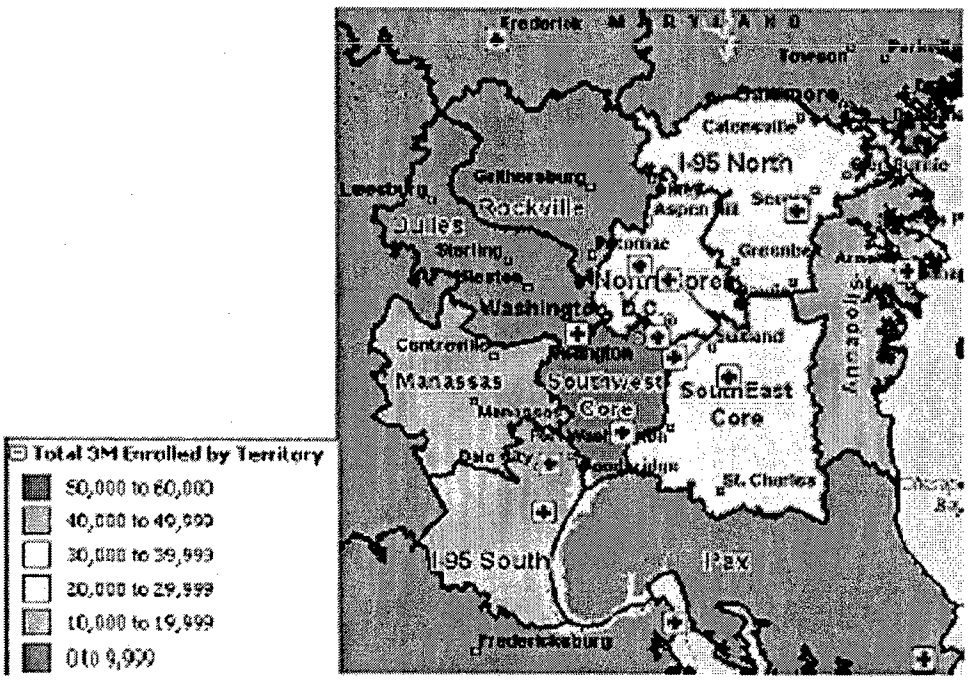

Figure 3. National capital area TRICARE enrollee density.

From "*FY-05 Business Plan*" by the National Capital Area Multi-Service Market Manager Office, 2004, p. 19.

In February 2004, the DeWitt healthcare system had 90,988 enrolled beneficiaries, and the Quantico NMCL had 27,321 enrolled beneficiaries. These two healthcare systems account for 42% of the NCA's total enrolled TRICARE Prime beneficiary population. TRICARE Prime and other eligible beneficiaries continue to move to the southern regions of the NCA as housing prices and housing availability continue to be issues in and around the metropolitan D.C. area (Bain & Company, 2003; Bristol Group & Innova Group, 2001). As a result, the DeWitt healthcare system and the NMCL at Quantico will likely continue to see an increase in demand for healthcare services, and an increase in enrolled beneficiaries.

Besides the competition from other federal and civilian healthcare systems, the NCA healthcare environment is also shaped by the TRICARE Next Generation (TNEX) contracts, the implementation of revised financing for healthcare reimbursement, the political factor inherent to Washington, D.C., and the perennial budget constraints that confront the MHS and the Army Medical Department (AMEDD). The combination of these and other political, regulatory, technological, and competitive factors (Ginter, Swayne, & Duncan, 2002) create a dynamic environment in which strategic planning and capital budgeting decisions require detailed data collection, analysis, and coordination with other military services. A fundamental aspect of the strategic planning process involves the capital budgeting decision process. Capital budgeting decisions tend to focus on the acquisition of long-term or long-life fixed assets (e.g., buildings, infrastructure equipment) or major construction projects. These decisions are an organization's primary mechanism to implement strategic plans (Gapenski, 2003). Capital budgeting decisions "may represent the most difficult and important management decision area. The allocation of limited resources to specific project areas will directly affect the efficiency, effectiveness, and continued viability of the organization" (Cleverly & Cameron, 2003, p. 342). In this context, the

term 'organization' is synonymous with the military health system. Therefore, decisions affecting the replacement, sustainment, or renewal of capital assets such as healthcare facilities, must be made with a focus on the future, while simultaneously supporting strategic plans and considering the impact on current missions and operations.

Facility life cycle management.

Healthcare facilities are the MHS's largest capital assets. In order to protect these assets, the Army Medical Command adopted a facility life cycle management strategy in the early 1990s. This strategy seeks to maintain and replace facility capital assets in support of AMEDD strategic and healthcare business plans (U.S. Army Health Facility Planning Agency [USAHFPA], n.d.). This facility life cycle management strategy follows a 50-year strategic investment cycle that is marked by five distinct phases.

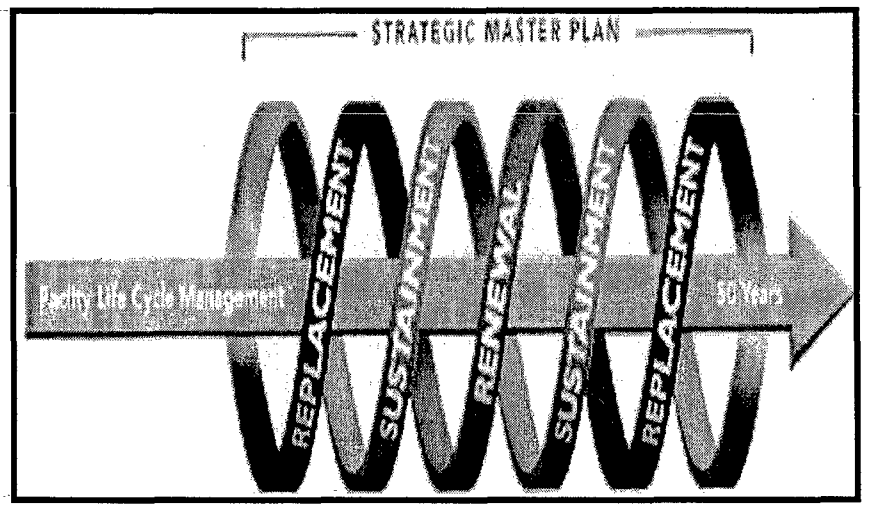

Figure 4. Army Medical Department facility life cycle management investment cycle.

From "*Readiness, Facility Life Cycle Management,*" by the U.S. Army Health Facility Planning Agency, n.d., p. 3.

The central phase, renewal, typically coincides with the 25 year mid-point of a facility's programmed life (USAHFPA, n.d.). In April 2002, the TRICARE Management Activity and each service Surgeon General's office established the first MHS Medical Facilities Life Cycle (MFLC) Management Plan. This plan codified goals, objectives, and initiatives for the MHS to use in streamlining the acquisition, sustainment, restoration, and modernization process for MHS real property infrastructure. The three goals are focused on obtaining the right facilities, with the right quality, using the right resources (Health Affairs [HA], 2002).

In order to manage the facility life cycle management process, the MHS utilizes a Department of Defense (DoD) military construction (MILCON) timetable to synchronize the multiple processes involved in building or renovating a facility. MILCON projects are divided into major and minor construction projects. Major MILCON projects are individual line item construction requirements that typically cost more than $1.5 million, whereas minor MILCON construction projects typically cost between $750,000 and $1.5 million (TRICARE Management Activity, n.d.). The actual MILCON timeline for each facility depends upon the size, complexity, execution strategy, or physical location of the facility. However, in general, each MILCON project follows a timetable that is broken into four distinct phases (a) project planning, (b) project development and design, (c) project approval and funding, and (d) project construction (HA, 2002). Historically, the medical MILCON timetable has averaged six to seven years, with a two-year construction component (Bond, 2004; HA, 2002). The 2002 MFLC management plan revamped and streamlined this process from an "as is" timeline of 331 weeks, to a "to be" timeline of 233 weeks (HA, 2002). The construction component is two years for both the current and proposed timelines, so the timeline reduction affected the planning, design, and funding phases.

Risk exists by reducing the planning and design timelines. The project planning and project development and design phases are critical for the MHS in order to effectively implement strategic plans. If the planning and design is poor, then the MHS could end up with a facility that does not meet patient and mission requirements, and subsequently, this facility becomes a drain on scarce resources. However, the MHS has mitigated this risk by employing new decision-support systems and processes. The advent of better, faster, and accurate automated data collection systems and executive information systems such as MHS Management Analysis and Reporting Tool (MART) have enabled the MHS leadership to collect, analyze, and apply precise data to decisions much faster than in the past. Furthermore, the MHS has adopted and consistently used business planning and decision-support tools to evaluate projects in a timelier manner. Most importantly, the MHS has adopted new governance structures that support enterprise-wide decision making in order to best meet the local healthcare needs of patients (Winkenwerder, 2003).

In FY 2004, the TNEX contracts mandated a new paradigm of resource sharing and cooperation within the MHS. The TRICARE governance plan established a senior multiple service market manager "responsible for coordinating the development of a single business plan representing all the MTFs located within the respective multiple service market" (HA, 2003, p. 2). Within the NCA, the WRAMC commander was designated as the senior market manager (HA, 2003). The parochialism of the past is no longer an option in this new healthcare market.

> The NCA MHS must no longer view itself as separate entities in competition, rather it must act as one entity serving a shared population. Greater economies of scale can be obtained by focusing on the beneficiary first and matching production capacity to the demographics, and provide equal access to all Prime

beneficiaries regardless of Service specific MTF enrollment (MSMMO, 2004, p. 9).

As a result, individual facility master plans and strategic goals must now be considered in the context of the NCA healthcare market, and each facility's master plan must be tied into the multi-service market business plan. The past practice of executing facility construction or renovation projects in a closed environment (i.e., focusing only on service-specific effects) is no longer viable.

The United States Army Health Facility Planning Agency (USAHFPA) has the opportunity to interface with the multi-service market manager office and the senior market manager to develop a market-wide facility master plan. This overarching master plan would attempt to leverage current and proposed medical facility assets to meet NCA healthcare needs, streamline MHS operations by reducing or realigning clinical capabilities to avoid unnecessary redundancy, and augment a MHS strategic plan to meet the readiness and healthcare mission in the NCA.

Conditions that Prompted the Study

Currently the Army has two medical treatment facility MILCON projects in various stages of completion within the NCA. These major MILCON projects are for Walter Reed Army Medical Center and DeWitt Army Community Hospital. In 1999, WRAMC and USAHFPA initiated a more than $200 million dollar renovation project (BMAR & Associates, 2002). This renovation is part of a facility master plan designed to repair WRAMC's aging physical plant and "promote staffing efficiency, improve business practices and enhance care delivery" (BMAR & Associates, 2002, p.8). The DeWitt Army Community Hospital MILCON project involves construction of a new $100 million facility on Fort Belvoir, and began with master planning in 1997. The DeWitt MILCON project is meant to remedy the aged and deteriorating current facility, while increasing access to certain specialty care services for beneficiaries in northern

Virginia. At this time, no plans exist to raze the current hospital once the new DeWitt Hospital is built.

WRAMC MILCON

Numerous issues confront the Walter Reed renovation project. Foremost is the physical condition of WRAMC's physical plant. Since it became operational in 1978, WRAMC has not consistently programmed and applied funding toward maintenance (especially preventive maintenance) and renovation of its physical infrastructure. As a result, numerous systems to include power and power generation, plumbing, and heating ventilation air conditioning (HVAC) are inadequate to effectively support all of WRAMC's patient care missions. Additionally, the 1978 facility was built around an inpatient model, and is not sufficiently flexible in its physical design and configuration to efficiently adapt to changes in healthcare technologies and healthcare trends including the current emphasis on outpatient and ambulatory care.

Other issues confronting WRAMC involve space. WRAMC has serious space constraints not only in the medical center itself, but also on the Walter Reed campus. Because of its location in a densely population metropolitan area and concomitant zoning laws, WRAMC does not have the opportunity to readily expand in size. Patient care waiting areas, clinical department storage areas, patient rooms, and other patient care areas are woefully inadequate in many departments and areas of the medical center. Furthermore, parking areas on the campus do not sufficiently accommodate patient and staff parking needs.

Besides WRAMC's MILCON project, two other significant construction projects are underway or are templated for the Walter Reed campus. First, the old, unoccupied Walter Reed Army Institute of Research (WRAIR) building is currently undergoing renovation by a civilian construction firm to provide more administrative space and offices in the future. Second, plans to

build a new enhanced-use lease facility on the campus accommodating a variety of future tenants are being pursued. The construction associated with these two projects, and the increased population on the campus further exacerbates the parking problem.

In an effort to address the space constraints, a strategy of the WRAMC MILCON renovation project includes a 'leapfrog' approach to create swing space and allow for construction to occur without shutting down the entire facility. This is not an optimal situation as it potentially necessitates multiple moves of different departments among various facilities, confuses patients and staff with way-finding, and does not allow for simple, turn-key operations once renovation is completed.

DeWitt MILCON

The DeWitt MILCON project involves construction of a new 375,000 gross square feet hospital designed to accommodate an increased primary and specialty care workload, and is expected to open in FY 2009. The current DeWitt hospital was built in the 1950s, and like WRAMC, was built on an inpatient model. The current facility is not easily adaptable to current healthcare trends and technologies, and still has some of its original infrastructure such as generators. Additionally, the increase in the TRICARE Prime beneficiary population in northern Virginia requires the addition of certain clinical services and providers. Fort Belvoir, however, is not nearly as constrained with space as WRAMC. The new DeWitt will be built at a new location on post, and the old DeWitt hospital will remain intact.

An issue facing both WRAMC and DeWitt concerns patient access to care. According to Penchansky and Thomas (1981), access can be described using five dimensions: accessibility, availability, accommodation, affordability, and acceptability. Of particular importance to TRICARE Prime beneficiaries in the NCA are the dimensions of accessibility and availability.

"Accessibility refers to the fit between the location of a provider and the location of patients" (Shi & Singh, 2001, p. 496). TRICARE Prime distance access standards are currently 30 minutes from an enrolled beneficiary's home for primary care services, and one hour from home for specialty care services (TRICARE Management Activity, 2005). However, in the NCA market, these standards are meaningless. According to the 2004 Urban Mobility Report, Washington D.C. and its surrounding suburbs had the fourth worst travel time index of very large metropolitan areas in the United States (Schrank & Lomax, 2004). Current TRICARE Prime distance planning factors for primary care are 20 miles from a provider, and 40 miles for specialty care. For many patients, these access standards of time and distance are seldom met, especially when travel to the major medical centers is required. Real estate prices around the medical centers and Ft. Belvoir are extremely high, requiring many beneficiaries to live farther away in the suburbs of metropolitan Washington, D.C. When patients must travel to the military hospitals for appointments or treatment, traffic is typically too congested to allow patients the luxury of driving only 30 minutes to an hour for an appointment.

The second dimension of access, availability, "refers to the fit between service capacity and individuals' requirements" (Shi & Singh, 2001, p. 496). With the changing demographics of the TRICARE eligible population in the NCA, and other constraints such as operational deployments of providers throughout the region and the reduction of staff in some facilities, certain MTFs are faced with the need to increase services to meet the healthcare needs of beneficiaries.

The NCA multi-service market manager is concerned with patient access. In his 2005 multi-service market business plan, Major General (MG) Farmer stated the need to develop business strategies and plans to increase access to primary and specialty care for TRICARE Prime

beneficiaries (MSMMO, 2004). Improving access in the NCA has several benefits. First, improved access can result in better patient satisfaction and cost savings for the MHS in the NCA. By providing more convenient healthcare services in relation to TRICARE Prime beneficiary residences, the MHS can potentially reduce the number of consults and referrals sent to the TRICARE network of providers. Second, having more services available in areas with high concentrations of non-enrolled beneficiaries might encourage more of these eligible beneficiaries to enroll in TRICARE Prime. An opportunity exists for better alignment and sharing of resources among the different MTFs in the NCA. Specifically, the NCA has the opportunity to align facility infrastructure and clinical capability with the clinical needs of its patients.

Statement of the Problem or Question

What is the optimal facility infrastructure at DeWitt Army Community Hospital to meet the specialty care needs of TRICARE prime beneficiaries in Northern Virginia?

Literature Review

Historically, federal and private-sector organizations (to include healthcare organizations) have not done well with capital asset management. "Federal facilities continue to deteriorate, backlogs of deferred maintenance continue to increase, and excess, underutilized, and obsolete facilities continue to consume limited resources" (National Academy of Sciences, 2004, p. 1). The private-sector has not fared well either. An analysis of research reports from the 1980s and early 1990s indicated that private-sector organizations did not link facility management decisions with business or financial planning (Then, 2003). By not linking facility management decisions to organizational strategic plans or objectives in light of the changing

financial and reimbursement landscape, healthcare organizations found themselves in a situation of facility mismatch and early facility obsolescence.

A clear example of this mismatch was seen with the shift in healthcare delivery from inpatient to outpatient settings and changes in healthcare reimbursement practices. Up until the mid 1980s, most healthcare facility design was centered on an inpatient care model. High fee-for-service reimbursement rates encouraged hospitals to keep patients within their facilities for longer periods of time (Shi & Singh, 2001). With the advent of Medicare prospective payment system for acute care hospital inpatient reimbursement in 1983, the tighter controls placed on hospitals by managed care organizations, and advances in medical technology, (Fox, 2001; Henderson, 2002; Shi & Singh, 2001), hospitals no longer found it financially acceptable to keep patients in for lengthy, oftentimes, unnecessary stays. The model of healthcare delivery shifted to less costly and less invasive outpatient or ambulatory settings and centers. Healthcare organizations began to realize that a large inpatient infrastructure did not support this change in healthcare delivery.

Healthcare organizations have also not done a good job of maintaining the facilities currently owned and operated. Facilities themselves were viewed as a resource drain, and subsequently, funding for operations and maintenance has typically been inadequate (Kurmel & Weitzner, 2005). The annual Department of Defense (DoD) funding target for sustainment, restoration, and modernization (SRM) projects is 3% of the plant replacement value (PRV) of a facility. In the AMEDD alone, chronic medical under-funding resulted in large backlogs of facility maintenance, repair, and construction projects, represented in Figure 5.

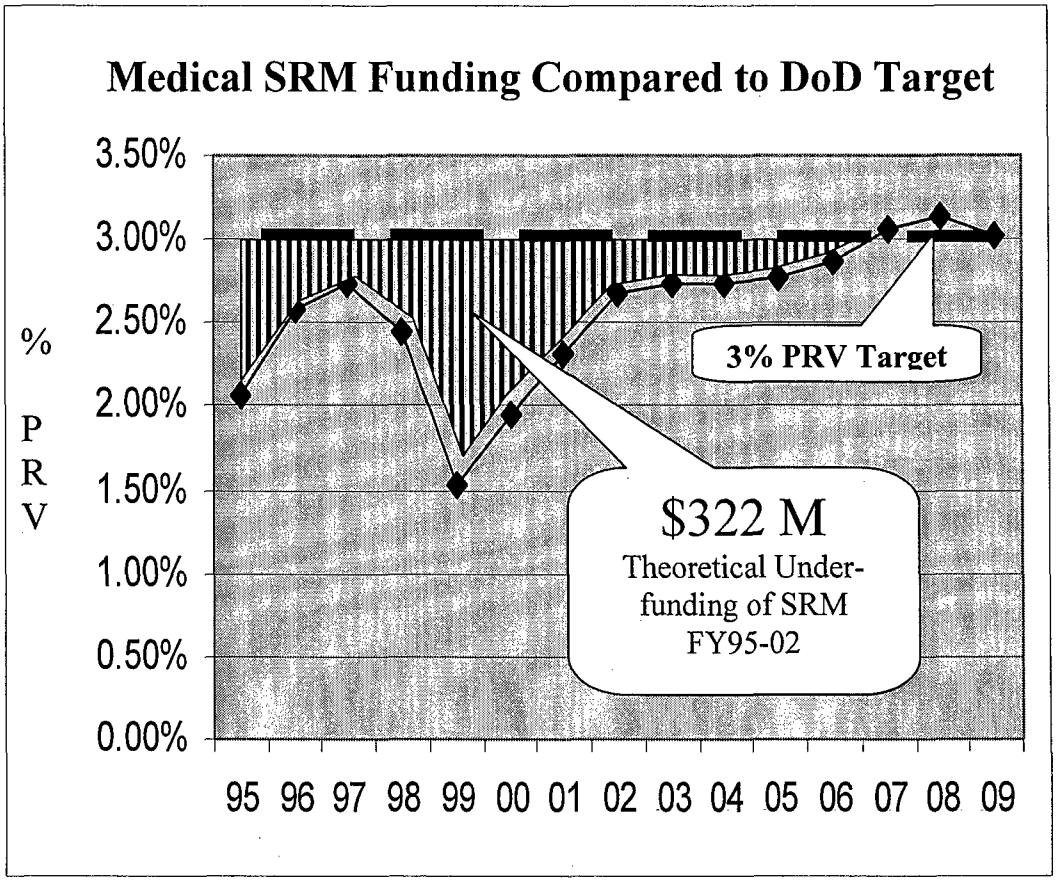

Figure 5. AMEDD facility life cycle management under-funding.

From "*Army FY06-11 Medical Program Objective Memorandum (POM) information brief*," by COL Rick Bond, 2004, slide 6.

This chronic under-funding has led to an environment of reactive versus preventive maintenance, and subsequently, the facility infrastructure of some AMEDD treatment facilities such as Walter Reed are in dire need of renovation and repair. According to the Department of Defense and service officials, the monies devoted to facility maintenance and military construction have not been sufficient to restrain the deterioration and / or obsolescence of active duty facilities (Government Accountability Office [GAO], 2003).

Finally, past approaches to MHS facility planning are no longer viable and effective in today's healthcare environment. Former capital investment or 'facility planning' was focused on

each Services' (Army, Navy, Air Force) provision of direct care, with little concern for competition from other military, federal, or civilian healthcare organizations. Additionally, these investment decisions were construction centric, and utilized cost-based budgeting. The main drivers for investment decisions involved the condition of the facility, mission changes (for instance, the draw-down of forces in Europe following the fall of the Iron Curtain and subsequent hospital closures), and other external factors such as political pressures (Kurrmel & Weitzner, 2005).

Today, various trends and pressures affect MHS facility planning. The award of the TNEX contracts dramatically changed the way the MHS conducts business. The TNEX contracts offered new incentives for military medical commanders to optimize direct care, developed a joint governance plan by which all the Service Surgeons General established standardized performance objectives, created a new governance structure with significant responsibilities for market managers, mandated joint decision-making and effective resource allocation, and required the development of a single, integrated business plan (HA, 2003). The TNEX contracts have required MTF commanders to scrutinize referral management, and have phased in a revised financing system for TRICARE.

Under revised financing, the regional managed care support contractor will bill the MTF for care that TRICARE Prime enrollees receive in the network. As a result, MTF commanders will feel the fiscal pain of not providing services to Prime beneficiaries within the facility or the military healthcare system, and commanders will be required to perform strategic planning to decide what services or product lines they want in their facilities, and what services or product lines they are willing to pay for in the network (Harben, 2004). This requires commanders to understand and respond to their enrolled beneficiaries' healthcare needs. This integration of

resources is similar to regionalization models that have been executed in the civilian sector. Integration of healthcare services has the potential to reduce unnecessary clinical redundancies, and promote increased collaboration among providers in the system. Effective integration reduces the cost of providing healthcare while simultaneously improving access to healthcare and the quality of care rendered (Clark, 2002).

How then, should a healthcare organization go about business planning to determine what types of facilities are needed to support its mission and beneficiary population? This has not been an easy endeavor for the MHS. To assist with this business planning process, the MHS partnered with civilian healthcare consulting firms specializing in population health and global business consulting firms to obtain unbiased, baseline information and develop enterprise-wide courses of action for the NCA. Since 2001, three major studies analyzing healthcare delivery in the NCA have been commissioned by the MHS. In March 2001, the Office of the Lead Agent, TRICARE Northeast, Region 1, commissioned two healthcare planning firms, The Bristol Group and the Innova Group, to assist the Lead Agent and a working group from the MTFs in studying the healthcare utilization patterns of beneficiaries in the NCA. "This study was envisioned as a first step in gathering the information necessary to ultimately answer questions related to the optimal configuration of clinical services within the region" (Bristol Group & Innova Group, 2001, p. 2-4).

The second study was more focused in its scope. Again in 2001, the Office of the Lead Agent, TRICARE Northeast, Region 1, contracted the First Consulting Group to perform an analysis of access to outpatient specialty care in the NCA. The scope of the project was to assess existing access and develop recommendations to (a) improve beneficiary access to the direct care system, (b) improve specialty care referral business processes, (c) re-capture appropriate

specialty care from the network, and (d) improve the transfer of clinical information between specialty care providers and primary care managers (First Consulting Group, 2001).

The third study was commissioned in January 2003. At that time, Bain & Company were commissioned to support the National Capital Area Strategic Planning Group by conducting a "short-term assessment of the MHS in the NCA, and to provide recommendations for greater integration of services and programs" (Bain & Company, 2003, p. 1). Together, these studies have provided baseline information and recommendations for the NCA military healthcare leadership to make business decisions affecting military healthcare delivery in the national capital region.

Now that the NCA MHS leadership had this baseline information, how could the MHS utilize this information to make good business plans and decisions? In February 2003, the MHS officially adopted the business plan concept. The guidance from the Office of the Secretary of Defense (OSD) Health Affairs was that MTFs will create business plans using standard measures to answer several questions. Questions that were significant to facility infrastructure concerned the following (a) the number of people expected to enroll in each facility, (b) how the facility is going to meet enrollee healthcare demands that the facility can not provide, (c) what amount of healthcare the facility is expected to produce, (d) the manpower resources the facility will need to produce healthcare, and (e) the major changes in the facility that will affect the amount of healthcare produced (Smith, 2004). In turn, each service developed its own model for business planning. The Army chose a production model focused on variables, the Air Force chose a model that identifies baseline metrics and requires performance monitoring, and the Navy adopted a model that relied on guidance, initiatives, and process improvement to develop its business plans (Moilanen, 2005).

An analysis of the service-specific business plans, the three consulting group studies previously discussed, the guidance from OSD Health Affairs, and a review of private-sector healthcare business planning indicated some common themes and processes with healthcare business planning. Underpinning the entire process is the fact that the organization's strategic plan will inform the business plan. Distilled to the minimal necessary steps, the process begins with identifying baseline demographic information such as patient enrollment, current services offered, and current clinical capability for each MTF / market. Second, patient utilization or demand data is obtained for each MTF / market. Third, the necessary staffing and resources required to support the patient demand is calculated using various financial and manpower tools, and fourth, the business plan is developed and executed. This is not a linear process. A feedback step involves monitoring the business plan, and changes to the plan are made as required.

Once the organization has developed its business plan, it can develop its facility lifecycle management plan, commonly referred to as a facility master plan. In an ideal situation,

> a facilities master plan would naturally evolve from the clinical service priorities of the strategic plan and the business plans of each service line. These plans would take into account the community's demand for health services, market opportunity, operational and financial facts, and provide the workload projections for the space demands and location requirements, which, together with the capital allocations, are the essential inputs for a comprehensive facility plan. Such a "master" plan would then allow the organization to select facility projects for implementation in accordance with the agreed-upon strategies (Rettig, 2001, p. 1).

Facility master planning must be integrated with the healthcare organization's overall strategy, the input from clinical leaders, and the input from administrative leaders and the facilities engineering staff. If all these elements do not work in concert during the planning and design phases of a facility project, then the end result could be a facility that does not meet the needs of the patients, the community, and the organization. A pictorial representation of an ideal master planning process is represented in Figure 6.

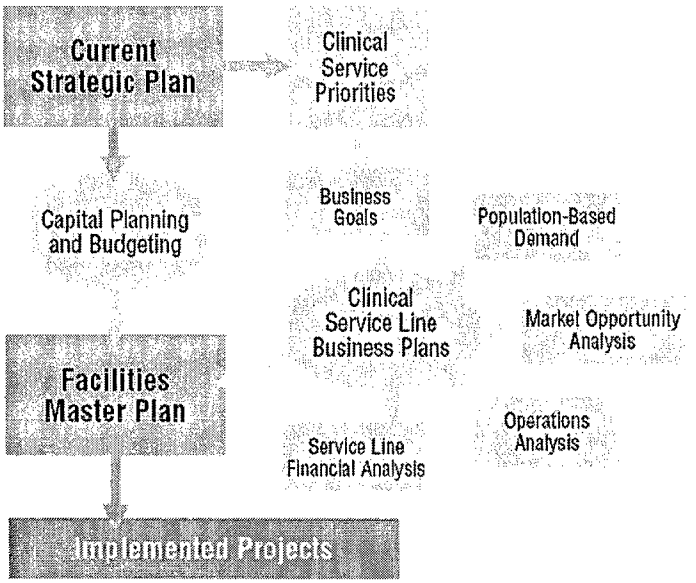

Figure 6. Ideal master planning process.

From "*Bricks not clicks,*" *by* Rettig, 2001, p.1.

The ideal master plan model is complex and requires extensive data collection and analysis. A more streamlined facility master plan model is represented in Figure 7.

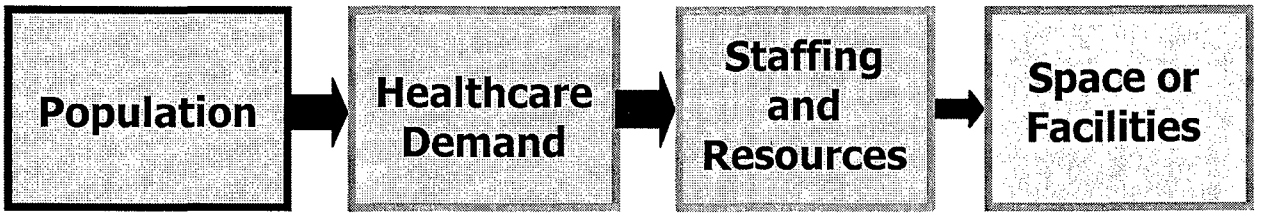

Figure 7. Reduced facility master planning model.

From "*A Comparison of DoD and Private Sector Investment in Facilities Modernization,*" by Kurmel and Weitzner, 2005, slide 45.

Though not as complex as the ideal master plan model, this reduced model is still an effective planning tool that healthcare organizations can use to identify facility and space requirements to meet patient care needs identified in the facility's strategic plan.

Purpose of the Study

The purpose of this study is two-fold. First, the study will identify select specialty care facility and space requirements needed at DeWitt Army Community Hospital if the patient population served encompassed all of northern Virginia, and patient workload for patients living or assigned to Virginia was shifted from other NCA MTFs. Second, this study will recommend various facility options to the multi-service market manager, the WRHCS commander, and the DeWitt Army Community Hospital commander in an effort to better meet patient care needs of TRICARE Prime beneficiaries in northern Virginia, while simultaneously addressing current facility shortfalls / issues within the WRHCS. These options afford the opportunity to clinically "load balance" the MHS market in the NCA, and subsequently improve access to care.

Method and Procedures

This is a descriptive study using an ex post facto design. The method of data collection will involve interrogation / communication (Cooper & Schindler, 2003) and will compile data from multiple DoD and MHS electronic data sources, and necessary site visits. The streamlined facility master plan model represented in Figure 7 provides the framework for this study, with the focus of the study being the four major elements of the facility master plan model.

Population

General patient demographic information within the NCA will be obtained to understand the users of the MHS in the NCA. This information will be obtained using the Defense Enrollment Eligibility Reporting System (DEERS), and M2 automated information systems. DEERS is a DoD computerized database of military sponsors, families and others who are entitled under the law to TRICARE benefits and registration in this system is required for TRICARE eligibility. M2 is a DoD enterprise-level information system with standardized data fields for each service that pulls information from other DoD information systems. Therefore, when comparing data from Air Force and Navy facilities, the data will be consistent. For the purpose of defining a beneficiary's home of record in this study, the duty station zip code is used for active duty. For all other beneficiaries, the home zip code listed in DEERS is used.

Several underlying assumptions were made concerning the beneficiary population in the NCA. First, military personnel strengths will not change significantly over the next few years. As a result of the Global War on Terrorism, the NCA military population is likely to increase slightly, rather than decrease. A second assumption is that the current base area realignment and closure (BRAC) recommendations will not affect NCA population demographics dramatically. A third assumption is that enrollment trends will follow eligibility trends. For example, active duty

members and their families are more likely to enroll in TRICARE Prime than retirees. A fourth assumption is that as private healthcare insurance premiums and costs continues to rise and continued emphasis is put on enrolling eligible beneficiaries in TRICARE, a greater number of TRICARE Prime eligible beneficiaries will choose to enroll in TRICARE. The final assumption is that population distribution patterns experienced over the past few years will continue into the future. Namely, as new eligible beneficiaries enter the market area, they will migrate to the south, north, and west of the DC area due to high costs of living in metropolitan DC.

Healthcare Demand

Previous MHS-sponsored studies (such as the 2003 Bain & Company study) focused on primary care, and inpatient and outpatient specialty care services throughout the entire NCA. This study was narrower in scope. Only non-invasive or minimally invasive ambulatory physician specialty consult data was used for analysis in this study. Physician specialty care data were used instead of primary care data because specialty care appointments constitute the bulk of appointments in the NCA for the MHS. Additionally, primary care delivery typically requires less capital equipment and infrastructure resources when compared with specialty care services. Furthermore, specialty physician salaries are higher than primary care providers (to include physicians, physician assistants, and nurse practitioners), and the need to send beneficiaries to the network due to the unavailability of specialty physicians at MTFs costs the MHS more money. Non-invasive or minimally invasive specialty data were used because the trend of performing outpatient, ambulatory procedures is likely to continue in the future.

The data collection process for healthcare demand involved several steps. Initially, the top 10 first quarter FY 2005 non-invasive or minimally invasive physician specialty consults by volume for enrolled beneficiaries in the NCA were identified. This information was obtained from the

consult (CON) module of the automated Composite Health Care System (CHCS), and accessed via the NCA's multi-service market manager's website. Once these 10 specialty areas were identified, the FY 2004 demand / utilization for these consults were determined. This demand information was obtained using the integrated clinical database (ICDB) which electronically pulled patient visit data from CHCS. This information was then stratified by mapping patient residences and duty assignments for each type of visit to five geographic areas: the NCA overall, Maryland, Virginia, the District of Columbia, and other states. Once this was done, the demand for these services by patient residence was determined for three MHS inpatient MTFs (WRAMC, NNMC, and DACH). Malcolm Grow Medical Center was not included in this analysis because this facility is undergoing a reduction in services provided, and these three MTFs provide the bulk of care to military beneficiaries in the NCA. This process allowed for a demand comparison among these three facilities, in order to determine the residential location of the patients utilizing these specific specialty care services. The scope of this study was further narrowed by: 1) focusing on only one inpatient facility, DACH and the corresponding DeWitt healthcare system, and 2) by looking at demand data for beneficiaries living in Virginia, Maryland, and the District of Columbia. This study departed from previous NCA studies by then applying the total Virginia enrollee demand data to only DeWitt hospital. This rationale stems from the patient-centric approach to this study. If the NCA MHS is attempting to increase access to specialty care for TRICARE Prime beneficiaries, then it must have facilities in closer proximity to its enrolled population.

Several assumptions were made concerning the demand / utilization. First, all consults appointed or written by providers were medically necessary, and were not influenced by defensive medicine practices. Therefore, each consult is a proper consult, and is an accurate

reflection of the medical demand within the NCA. Second, for each of the 10 specialty care areas, the administrative closure rate (that is, an appointment not kept by a patient or an appointment not scheduled in time) does not reduce the demand for healthcare services in the NCA. A third assumption is that current operational missions and requirements (e.g., deployed providers) have not had a significant impact on the number of consults written. A final assumption is that demand for specific specialty care services will not change significantly over time.

Staffing and Resources

After the specific demand data for each specialty care service are identified, the study will utilize the Medical Group Management Association (MGMA) 2004 Physician Compensation and Production Survey Report benchmarks to identify various staffing scenarios for specialty care providers at DeWitt. This MGMA report is a national level report that compiles data from more than 40,000 providers and 1,800 medical organizations representing 106 different physician specialties (Medical Group Management Association, 2004). Three benchmarks will be used (a) private practice ambulatory encounters, (b) academic facility ambulatory encounters at 67% clinical billable activity, and (c) academic facility ambulatory encounters at 100% clinical billable activity. At the same time, the median and mean values for these various benchmarks will be applied to the demand data. The resulting six different staffing scenarios will provide the NCA MHS leadership various staffing models to consider that meet the identified demand. According to the Bain & Company survey for 30 clinical service lines studied, "NCA MHS provider productivity is approximately 50% more productive than academic center benchmarks, and approximately 35% less productive than private practice benchmarks" (2003, p. 3). Therefore, a range of staffing options will be provided to the MHS leadership. The private

practice benchmarks would identify the lowest number of specialty providers needed to support the demand, and the 67% billable clinical activity academic benchmark would represent the upper end of the staffing requirement spectrum. An assumption in this study is that current MHS physician productivity will not change significantly. That is, technological advances, changes to current facility infrastructure, support staff changes, or other factors will not affect a provider's productivity. A final staff and resource assumption is that the current staffing levels for these 10 specialty services at DACH will remain the same for the new facility.

As part of the assessment of staffing and resources, the current number of providers for these 10 specialty care services, and the current number of rooms available to these providers at DACH will be identified, and then compared to the updated requirement. Only permanent staff and consistent circuit-riding staff members will be considered in the analysis. Physician residency program personnel or physician vacancies will not be considered.

Space or Facilities

Once the MGMA staffing benchmarks have been applied, and staffing requirements identified, the DoD medical planning criteria guide will be used to identify the space requirements for the two highest volume specialty care patient areas analyzed in this study. Reception, clinic support (to include rooms such as clean and soiled utility rooms), and staff and administrative areas (such as administrative offices, records rooms, conference rooms, staff lounges), will not be considered in this study. Additionally, the focus is on physician rooms, so other ancillary clinical staff (such as a speech therapist in an otorhinolaryngology clinic) room requirements will not be considered in this study. The calculated space requirements for these two specialty services will be compared with current and proposed space allocations within the DeWitt MILCON project, and any shortfalls or surpluses identified.

Results

Population

Intuitively, the number of TRICARE eligible beneficiaries in the NCA is variable. A constant inflow and outflow of personnel and their family members due to permanent change of station (PCS) cycles, expiration of term of service (ETS) cycles, and retirement cycles ensures that the beneficiary population does not remain constant. However, fairly consistent annual beneficiary population numbers were obtained. According to analysis performed by the Bristol Group and Innova Group in August 2001, there were approximately 447,000 eligible beneficiaries in the NCA (Bristol Group & Innova Group, 2001). In June 2004, an analysis of DEERS and M2 indicated an eligible beneficiary population of approximately 455,000 (MSMMO, 2004), with the largest numbers of eligible NCA beneficiaries living in Virginia.

Healthcare Demand

Aggregate FY 2004 patient demand within NCA

According to information obtained from ICDB, in FY 2004, military beneficiaries made more than 3.2 million appointments among all the MTFs in the NCA, with patients coming from numerous states, OCONUS military installations, and various foreign countries. Of this, approximately 86% of these appointments (2.76 million) were for specialty care. As would be expected, the four inpatient MTFs saw the bulk of the appointments within the NCA, accounting for 65% of all patient appointments. WRAMC saw 24.45% of all patient appointments, NNMC saw 19.23%, MGMC saw 10.78%, and DACH saw 10.53% of all patients. When considering the DeWitt Healthcare System (DHCS), DACH and its three subordinate clinics, DHCS saw 21.07% of all patient appointments. Among WRAMC, NNMC, and the DHCS, these three organizations accounted for nearly 65% of the NCA's FY 2004 patient workload. This fact, and the reality that

MGMC will be reducing its services in the next few years, makes it appropriate to exclude MGMC healthcare demand data from this analysis. Further detail of the aggregate FY 2004 patient appointments is found in appendix B.

Tri-region FY 2004 patient demand within NCA

An analysis of appointments for patients living or assigned to Virginia, Maryland, and Washington DC indicated that these three geographical regions accounted for more than 2.83 million patient appointments (or 88% of the NCA total) in FY 2004. Of these 2.83 million appointments, 85% (approximately 2.41 million) were for specialty care. Table 1 presents the demand for specialty appointments from each of these regions.

Table 1

Geographical Demand for Specialty Appointments in FY 2004

State / Region	Specialty Appointments	% of Total Appointments
Maryland	1145761	47.5
Virginia	1137969	47.2
District of Columbia	126530	5.2

Note: Total number of specialty appointments for this period = 2410268. From 19 January 2005 Integrated Clinical Database query.

Patients residing or assigned in Maryland and Virginia accounted for nearly the same amount of specialty care consults. Among WRAMC, NNMC, and the DHCS, these three organizations accounted for more than 64% of all patient workload within this tri-region area. Further detail of the tri-region FY 2004 patient demand is found in Appendix C. For DeWitt Army Community Hospital alone, this facility saw approximately 255,000 specialty appointments, of which more

than 96% of its patients were from Virginia. Maryland and the District of Columbia beneficiaries treated at DeWitt hospital represented less than 4% of the patient demand for the tri-region area.

First quarter FY 2005 consult data

The consult data for first quarter, FY 2005 were obtained from the CON module of CHCS. The date range was from October 1, 2004 to December 14, 2004. Within this time period, there were 96 separate specialty consults, representing 78,667 total consults. From this list of 96, the top 10 physician specialty consults by volume were obtained, and are represented in Table 2.

Table 2

Total 1st Quarter FY 2005 NCA Healthcare Demand

Specialty	Consults Written	% of Total Consults
Orthopedics	7051	9.0
Dermatology	6195	7.9
Gastroenterology	4384	5.6
Cardiology	3474	4.4
Ophthalmology	2858	3.6
Gynecology	2739	3.5
Otorhinolaryngology	2659	3.4
Urology	2402	3.1
Neurology	2152	2.7
General Surgery	2009	2.6

Note: Total number of consults for this period = 78667.
From 15 December 2004 Composite Health Care System query.

These 10 consults alone count for nearly 46% of the total consults written during the first quarter, FY 2005. Once the top 10 volume physician specialty care consults were identified, a retrospective look at FY 2004 utilization for these specialties was performed.

FY 2004 Virginia beneficiary demand analysis

The 10 specialty care services accounted for nearly 21% of the total specialty appointments for Virginia residents in FY 2004. Table 3 delineates the breakdown by specialty. Overall, ICDB identified 60 specialty care services when accounting for FY 2004 appointments, so the remaining 50 specialty care services accounted for the remainder of the specialty care appointments.

Table 3

Virginia Beneficiary Specialty Care Demand in FY 2004

Specialty	Appointments from Virginia Beneficiaries	% of Total Virginia Beneficiary Appointment
Gynecology	44815	3.9
Cardiology	38106	3.3
Dermatology	27254	2.4
Ophthalmology	25603	2.2
Orthopedics	21589	1.9
Urology	20301	1.8
Gastroenterology	18141	1.6
General Surgery	15806	1.4
Otorhinolaryngology	15105	1.3
Neurology	9286	0.8

Note: Total number of Virginia appointments for this period = 1137969.
From 19 January 2005 Integrated Clinical Database query.

When considering the overall Virginia population demand for these particular 10 specialty care services, the DHCS, WRAMC, and NNMC accommodated the largest percentage of these patients. Table 4 presents the MTF accommodation for these specialty care services, with further detail found in Appendix D.

Based upon FY 2004 demand data for the tri-region area, the workloads accounted for by these 10 specialty service lines at DACH, NNMC, and WRAMC compared to the overall

Table 4

MTF Accommodation of Virginia Beneficiary Specialty Care Demand in FY 2004

Specialty	Appointments from Virginia Beneficiaries	% of Appointments seen at DHCS	% of Appointments seen at WRAMC	% of Appointments seen at NNMC	% of Appointments seen at other NCA MHS MTFs
Gynecology	44815	42.7	19.2	34.0	4.1
Cardiology	38106	15.6	40.4	36.9	7.0
Dermatology	27254	14.0	32.6	42.0	11.4
Ophthalmology	25603	15.6	41.5	38.3	4.6
Orthopedics	21589	46.3	16.0	27.6	10.1
Urology	20301	18.9	54.1	21.2	5.7
Gastroenterology	18141	25.5	50.8	20.6	3.1
General Surgery	15806	21.9	24.0	45.4	8.7
Otorhinolaryngology	15105	11.2	27.9	46.2	14.7
Neurology	9286	11.4	36.6	47.8	4.1

Note: DHCS numbers include patients seen at DeWitt Army Community Hospital, Woodbridge Clinic, Fairfax Clinic, and Rader Clinic

specialty care workload for these facilities were approximately 20%, 41%, and 44% respectively. If the Virginia patient workload for these 10 specialty care services were shifted from WRAMC and NNMC to the DACH, this would result in more than a 325% workload increase for DACH. Concurrently WRAMC and NNMC would see a reduction in workload of approximately 44%, and 41% respectively.

Staffing and Resources

At this point, the entire Virginia beneficiary demand for the 10 specialty care services provided the demand input for calculation of physician staffing requirements for these 10 specialty care areas using 2004 MGMA physician production benchmarks. Appendix E contains the MGMA tables for reference, and Appendix F presents the calculation sheet to determine physician staffing requirements among the various scenarios. This situation relates to the multi-service manager's directive to improve access to beneficiaries in the various submarkets of the NCA. The staffing scenarios ranged from a low of 83 physicians using the mean benchmark for private practice physicians, to a high of 153 physicians using the average median benchmark for academic practice physicians at 67% clinical billable activity. The 67% clinical billable activity takes into account the teaching and research aspect of physicians in academic medical centers. Table 5 presents the six staffing scenarios for full time equivalent (FTE) physicians.

Table 5

DeWitt Hospital Specialty Care Physician Staffing Scenarios Based upon FY 2004 Demand Data

Specialty	Private Practice Physicians Required		Academic Physicians at 100% Clinical Activity Required		Academic Physicians at 67% Clinical Activity Required	
	Mean Benchmark	Median Benchmark	Mean Benchmark	Median Benchmark	Mean Benchmark	Median Benchmark
Gynecology	17	20	15	20	23	23
Cardiology	13	17	13	23	14	26
Dermatology	5	6	7	7	10	11
Ophthalmology	5	6	8	9	11	11
Orthopedics	7	7	10	10	14	14
Urology	7	7	9	10	11	11
Gastroenterology	11	13	10	15	14	20
General Surgery	10	10	13	15	16	18
Otorhinolaryngology	4	5	7	8	10	10
Neurology	4	5	6	6	8	9
Total Physicians Required	**83**	**96**	**98**	**123**	**131**	**153**

Note: Staffing scenarios calcualted using Medical Group Management Assocation 2004 Physician Compensation and Production Survey Report.

Based off the statistics from the 2003 Bain & Company study, the MHS would need 35% more providers when compared to the private practice physician benchmark in order to be as productive as private practice physicians. Using the lowest private practice staffing benchmark of 83 providers to accommodate the Virginia beneficiary demand for these 10 specialty care services, this would require the MHS to have 113 providers. This figure is close to the 100% clinical billable activity academic median physician staffing level of 123.

The current staffing level of providers at DACH is presented in Table 6. A trend at DeWitt is the sharing of administrative and support staff and other resources with other departments and services within the facility. Administrative and support staff are shared amongst the

Table 6

DeWitt Army Community Hosptial Specialty Care Clinical Staffing

	Physician Staff			Non-Physician Practitioners		Clinical Support Staff		
Specialty	Military	Civilian or Contract	Circuit Rider	Physician Assistant	Nurse Practitioner	LPN	Medic	Technicians Assistants Clerks
Gynecology (shared with OB)	6	2	0	0	4	3	0	9
Cardiology	0	1	0	0	0	0	0	2
Dermatology	1	0	0	0	0	1*	0	2
Ophthalmology	1	0	1	0	0	0	0	0
Orthopedics	2	1	0	3	0	0	0	4
Urology	1	0	0	0	0	1	1	1
Gastroenterology	2	0	1	0	0	1*	0	0
General Surgery	3	0	0	0	0	0	0	2
Otorhinolaryngology	This service at DeWitt was discontinued in March 2004.					-	-	-
Neurology (adult only)	0	1	0	0	0	1*	0	0
Total Staffing	**16**	**5**	**2**	**3**	**4**	**5**	**1**	**20**

Note: Census of DeWitt Army Community Hospital specialty staff taken 17 December 2004, * = LPN shared by multiple specialty clinics

dermatology, gastroenterology, and neurology departments in a sub-specialty clinic. Additionally, cardiology services are part of the internal medicine clinic, and ophthalmology and optometry clinics share staff. Gynecology and obstetrics staff is commingled. Sharing of personnel resources is not necessarily a negative trend, and often results from product line grouping, or space and financial constraints.

However, a common theme amongst providers during the December 17, 2004 walk-through indicated a desire for more clinical and administrative staffing support.

When compared with the physician staffing requirements in Table 5, it becomes apparent that DACH would require a large influx of providers to accommodate an increased demand of services for Virginia beneficiaries if this entire population was treated within DACH. Table 7 provides the physician shortages based upon the six staffing scenarios for this increased demand.

Gynecology, cardiology, and gastroenterology services have the highest levels of physician shortfalls based upon the proposed staffing scenarios.

Table 7

DeWitt Hospital Specialty Care Physician Staffing Shortfalls Based upon MGMA Staffing Scenarios

Specialty	Current DeWitt Hospital Physician Staffing Level	Comparison with Private Practice Physicians Benchmark		Comparison with Academic Physicians at 100% Clinical Activity Benchmark		Comparison with Academic Physicians at 67% Clinical Activity Benchmark	
		Mean Benchmark	Median Benchmark	Mean Benchmark	Median Benchmark	Mean Benchmark	Median Benchmark
Gynecology	8	9	12	7	12	15	15
Cardiology	1	12	16	12	22	13	25
Dermatology	1	4	5	6	6	9	10
Ophthalmology	1.5	3.5	4.5	6.5	7.5	9.5	9.5
Orthopedics	3	4	4	7	7	11	11
Urology	1	6	6	8	9	10	10
Gastroenterology	2.5	8.5	10.5	7.5	12.5	11.5	17.5
General Surgery	3	7	7	10	12	13	15
Otorhinolaryngology	0	4	5	7	8	10	10
Neurology	1	3	4	5	5	7	8
Total Physician Shortfall		**61**	**74**	**76**	**101**	**109**	**131**

Note: Staffing scenarios based upon full time equivalent provders. Fractions indicate circuit rider physician staff.

Space or Facilities

As discussed in the 'Method and Procedure' section, the two highest volume services were analyzed for space requirements. In this study, gynecology and cardiology had the highest demand for services. Table 8 presents the current space allocation at DACH for the 10 specialty services analyzed in this study, and Table 9 presents the projected space allocation for the gynecology and cardiology services in the new DeWitt hospital construction.

Table 8

DeWitt Army Community Hospital Specialty Care Space Resources

Specialty	Dedicated Exam Rooms	Procedure / Treatment / Test Room	Dedicated Provider Office	Provider Office / Exam Room	Reception / Waiting Room	Storage or Linen Room	NCOIC / Staff Office	Break Room / Lounge / Conf. Room	Patient Toilets (Male and Female)	Staff Toilets (Male and Female)
Gynecology (shared with OB)	12	1	5	17	1	3	2	1	1	1*
Cardiology	1	4	0	1	1*	1*	1*	1*	1*	1*
Dermatology	0	3	0	1	1*	1*	1*	1*	1*	1*
Ophthalmology	0	2	1	2	1*	1*	1*	1*	1*	0
Orthopedics	3	3	1	4	1	1	1	1	0	0
Urology	0	3	1	2	1	2	2	1	1.5	0.5
Gastroenterology	0	0	0	4	1*	1*	1*	1*	1*	1*
General Surgery	Not observed.		-	-	-	-	-	-	-	-
Otorhinolaryngology	This service at DeWitt was discontinued in March 2004. Rooms are still present, but unoccupied.									-
Neurology (adult only)	0	0	0	2	1*	1*	1*	1*	1*	1*

Note: Room census for specialty areas taken 17 December 2004, * = room shared by multiple clinics

Table 9

Planned Patient Treatment Rooms at Future DeWitt Army Community Hospital

Room Type	Gynecology (shared with OB) Rooms	Cardiology Rooms
Procedure Room Toilet	1	0
Case Manager	1	0
Specimen Toilet	1	0
Weights and Measure	2	0
Officer in Charge (OIC)	1	1
Doctor's Office and Exam	22	2
Treatment / Procedure	1	0
Patient Toilet	1	1
EKG Testing	0	1
Holter Monitor	0	1
Treadmill	0	1
Echocardiography	0	1

Note: Data from March 28, 2003 DeWitt Program for Design Report, Health Facility Planning Agency

With the proposed staffing scenarios based upon accommodating a higher demand for services, several room shortfalls for the gynecology and cardiology services exist. Doctor offices and exam rooms represent the highest levels of shortfalls based upon the room types. Tables 10 and 11 illustrate the patient area room shortfalls for both the gynecology and cardiology services respectively. The shortage of doctor offices or exam rooms for the gynecology service ranges from a minimum value of eight rooms, to a maximum of 24 rooms. For cardiology services, the room shortfall range is five to eight. If any of these updated staffing scenarios were to be entertained, this would result in a redesign of the DeWitt MILCON project.

Table 10

Gynecology Room Requirement at DeWitt Community Hospital Based on MGMA Staffing Scenarios

Room Type	Planned Gynecology Rooms*	15 Physicians **	17 Physicians **	20 Physicians **	23 Physicians **
Procedure Room Toilet	1	1	1	1	1
Specimen/ Isolation Exam Toilet	1	1	1	1	1
Weights and Measure	2	3	4	5	5
Officer in Charge (OIC)	1	1	1	1	1
Doctor's Office and Exam Rooms	21	29	33	39	45
Isolation exam	1	1	1	1	1
Treatment / Procedure	1	2	2	3	3
Patient Toilet	1	2	3	3	3

Note: * = Data from March 28, 2003 DeWitt Program for Design Report, Health Facility Planning Agency
** = Data from DoD Space Planning Criteria for Health Facilities

Table 11

Cardiology Room Requirement at DeWitt Community Hospital Based on MGMA Staffing Scenarios

Room Type	Planned Cardiology Rooms*	13 Physicians **	14 Physicians **	17 Physicians **	23 Physicians **	26 Physicians **
Tilt Table Testing	0	1	1	1	1	1
Pacemaker, ICD Interrogation	0	1	1	1	1	1
Adult Screening Room	0	3	4	5	5	5
Officer in Charge (OIC)	1	1	1	1	1	1
Doctor's Office and Exam Roo	2	7	7	9	12	13
Treatment / Procedure	0	1	1	1	2	2
Patient Toilet / Shower	1	2	2	2	3	3
EKG Testing	1	estimate 3	estimate 3	estimate 3	estimate 4	estimate 4
Holter Monitor	1	1	1	1	1	1
Treadmill	1	2	2	2	3	3
Echocardiography	1	2	2	2	3	3
Echocardiography Records	1	1	1	1	1	1

Note: * = Data from March 28, 2003 DeWitt Program forDesign Report, Health Facility Planning Agency
** = Data from DoD Space Planning Criteria for Health Facilities

Discussion

The results provide various personnel staffing and space allocation scenarios that the NCA MHS leadership could adopt to better meet the healthcare demand of Virginia TRICARE beneficiaries. This analysis was based on the shifting of 100% of all Virginia beneficiary healthcare demand for 10 specialty care service lines to DACH. Even considering only the gynecology and cardiology service lines, implementing both these staffing and room scenarios would result in significant changes to the DeWitt MILCON project. At this time, implementation of these changes are unlikely due to financial constraints. The original DeWitt MILCON project was $120 million, and was reduced to $100 million in 2004. Attempting to increase the facility size to accommodate a workload increase of 325% would result in a dramatically larger facility, and in all likelihood, would not be politically palatable.

All or nothing approaches are not easily accepted, and incremental approaches to facility infrastructure issues and constraints would potentially be more successful. The NCA MHS leadership could better distribute limited healthcare assets across the NCA, and ease the workload burden of these specialty care services at WRAMC and NNMC by adopting several incremental approaches. These approaches could be done in isolation or conjunction with each other and include: (a) deciding on a percentage of workload, or even a specific number of patient appointments, to shift to DeWitt, (b) focusing on a limited number of service lines, and (c) focusing on one or multiple facilities. For instance, the MHS NCA leadership could decide it wants to focus on gynecology services only. Due to the close proximity of WRAMC and NNMC, the decision could be made that NNMC will assume all gynecology care for Maryland and Washington, DC beneficiaries, and these services will be discontinued at WRAMC. This would avoid the duplication of services currently provided at both WRAMC and NNMC.

Concurrently, all Virginia beneficiary gynecological care would be shifted from NNMC and WRAMC to DeWitt. By choosing this course of action, space would be freed up at WRAMC for the upcoming $200 million renovation project. The area formerly occupied in WRAMC by the gynecology service would be able to be renovated first with minimal interruption to other services, and once completed, the new occupant of this area would move in immediately following construction acceptance. This would mitigate or potentially eliminate the proposed 'leapfrog" approach currently envisioned for WRAMC, and speed up the renovation timeline. Because the new DeWitt Hospital has not been built yet, changes could be made in the planning phase to accommodate the increased gynecology workload at this facility, thereby increasing access to care for Virginia beneficiaries.

In order for the scenario described above to occur, discussions across the entire NCA MHS leadership would be required. Decisions to move or shift military healthcare assets into the northern Virginia market or other submarkets of the NCA would affect the MHS on an enterprise level, with secondary effects on other Federal and civilian healthcare organizations or systems, and other stakeholders. Such decisions would require the input from all services, regional MTF commanders, the TRICARE regional office, and a host of other DoD, Federal, and civilian healthcare leaders. Most importantly, decisions such as this would require a change of mindset among the services. The parochialism of the past is not conducive to effective enterprise-wide implementation of a market-wide facility infrastructure master plan. However, in light of some of the facility constraints and issues affecting DoD healthcare facilities in the NCA, the dwindling resources available to the MHS, other financial constraints, and the desire to improve access to eligible beneficiaries, changes must be made to the MHS facility infrastructure.

Of course, the decision as to what service(s) to shift or move would likely not be decided upon easily. Multiple confounders exist which could stymie relocation efforts. The political component associated with each specialty service and military service (e.g., Army, Navy, and Air Force) can not be ignored. Some of these specialty services are considered "centers of excellence," and even though the geographic locations of these clinical services are not in line with MHS strategic goals or beneficiary needs, the political clout contained within these specialty services and support from the respective military service could preclude the relocation of these clinical services. Additionally, the GME component to most of the specialty services offered in the NCA must be considered. Many of these programs are steeped in tradition, and the resultant accreditation issues and oversight of these programs could affect the ability to relocate services to another facility. As always, there exists a financial component to facility infrastructure decisions. Due to the long programming time required to implement MILCON projects, and the requirement to lobby for and obtain funding, a lack of funding or shifting of funding priorities could cause the abrupt termination of a specialty service relocation decision. Additionally, the effect of base realignment and closure (BRAC) decisions that are scheduled for FY 2005 could dramatically affect the MHS landscape within the NCA.

Conclusions and Recommendations

The current military medical facility infrastructure in northern Virginia is not capable of supporting the increasing healthcare demands of the Virginia beneficiary population. Adopting a patient-centric approach to healthcare delivery in the NCA would require the MHS to move healthcare assets into northern Virginia. The following is a list of recommended courses of action the NCA MHS could adopt to better meet the healthcare needs of its patients in this region.

Courses of Action

1. Expand the hours and days of operation for high demand services currently offered at DeWitt and the DHCS. This is a non-facility option that could be implemented relatively easily from a facility perspective. The costs to the MHS would be the additional providers and staff necessary to support these specialty services, supply and some equipment costs, and the education and marketing effort required to inform beneficiaries.

2. Use a 'circuit-rider' concept for specialty services not offered or no longer offered at DeWitt based upon projected demand. For instance, otolaryngology services were discontinued at DeWitt in March 2004, yet more than 11,000 Virginia TRICARE beneficiary appointments were made at WRAMC and NNMC in FY 2004 for otolaryngology. This concept could be applied to more than one specialty service. However, there would be space issues with this option due to the current crowding of services at DeWitt, and the long-term effectiveness and support for this program is questionable.

3. Increase the funding for the current DeWitt MILCON project to absorb more specialty care providers within the new facility, and permanently shift providers from other military MTFs in the region to DeWitt. For instance, as MGMC reduces its services offered, perhaps some of

the billets (and money) for these providers could be absorbed by the new DeWitt hospital project. If higher demand planning factors were to be used as in this study, this would inform the staffing and facility requirements for these services.

4. Renovate the old DeWitt facility to support an ambulatory, outpatient primary care and multi-specialty care clinic. Since expansion of the new DeWitt MILCON project is unlikely, the old facility could be used to support certain services, which would free up space in the new DeWitt for expansion or inclusion of other services. A variation of this scenario could entail turning the old DeWitt into the primary care and administrative support building. Only specialty care services and inpatient services would be built into the new facility. This course of action incurs the highest facility costs, but would provide for long-term effectiveness.

5. Initiate a medical MILCON project at Quantico to expand specialty services and capability at this facility. This option should reduce the current workload at DeWitt, and would also improve access for Virginia beneficiaries living south of Fort Belvoir. As with recommendation number four, there would likely be a significant facility cost involved with this recommendation.

6. Partner with the Veterans Health Administration (VHA) and share medical resources currently provided at these VHA facilities. The norm has been for the DoD and VHA to operate independently of each other. The 1982 Veterans' Administration and DoD Health Resources Sharing and Emergency Operations Act provided statutory authorization for VHA and DoD healthcare facilities to share facilities and services in order to more effectively and efficiently use federal health resources (GAO, 2004). The NCA senior market manager, MG Farmer recognizes this sharing opportunity to collaborate with the VA healthcare system. MG Farmer currently envisions sharing of ambulatory care resources in the vicinity of Fredericksburg, Virginia, and

graduate medical education (GME) referral and integration with select clinical specialties (MSMMO, 2004).

7. Partner with civilian healthcare systems in the region as in recommendation six. With the advent of revised financing, however, this option is not as attractive as it once was.

8. As part of the current WRAMC MILCON renovation project, build another facility on the WRAMC campus that would accommodate the clinical shortfalls currently faced at WRAMC. This course of action would be similar to the current amputee center that will be built adjacent to WRAMC and connected via a walkway or tunnel. This option could prevent the 'leapfrog' plan currently envisioned with the WRAMC renovation project, and would reduce the amount of turmoil and confusion faced by patients and staff. However, this option faces several challenges and does not specifically address the patient care needs in northern Virginia. Limited space exists for a new facility to be built on the current campus, and the community and other organizations within the NCA would likely challenge construction of a new building. This option would also entail a significant re-design of the current renovation plan, and could be considerably more expensive than what is currently programmed for the renovation.

Recommendation

A multi-phased, incremental approach to ameliorating the military medical specialty care clinical shortfalls in the northern Virginia market would improve patient access to care, and geographically align clinical resources with the beneficiary population. In the short-term, the NCA MHS leadership should conduct a financial analysis and marketing survey to assess the interest in expanding clinical hours and days of operation for the facilities in the DeWitt healthcare system (DHCS). The focus would be on the most expensive and highest volume

physician specialty care services required by Virginia beneficiaries. If economically feasible and desirable, DHCS should implement this practice immediately.

In concert with this expansion of hours of operation, the NCA MHS should further develop the circuit-rider concept and resources devoted to this program. These physicians would improve the access to specialty care in the northern Virginia market. This program should be codified by either a tasking or other regulatory mean to ensure compliance and consistent support from the MTFs affected. The circuit-rider specialty care physicians would come from the medical centers within the NCA or other facilities within the TRICARE North region, regardless of service affiliation. The NCA MHS leadership should monitor these programs for at least a year to determine the effects on the patient workload at WRAMC, NNMC, MGMC, and DHCS specifically. Additionally, the NCA MHS leadership should monitor the effect on patient satisfaction and any effects on GME programs currently provided in the NCA.

For a medium-range focus (two to five years), WRAMC and NNMC should aggressively work on reducing redundant services currently shared by both facilities. Due to their geographic proximity, WRAMC and NNMC should focus on certain specialty care product lines to avoid expensive and unnecessary redundancies of physicians, equipment, and space. Some examples where this practice is already underway include obstetrics and gynecology (OB/GYN) services, and to a limited degree, dermatology services. This decision would require the facilities to move beyond service parochialism, and would be politically difficult to accept. Invariably, there would be concerns with the GME programs affected, but again, the OB/GYN and dermatology GME programs have set precedence for the benefits associated with this endeavor. At the same time, WRAMC and NNMC could consider permanently shifting some services to the Veteran's Health Administration Hospitals for some of the same reasons discussed above. The permanent shifting

of clinical resources amongst various facilities could improve quality of care, reduce costs, and minimally impact patient access. A potential secondary effect could be the realization that between WRAMC and NNMC, enough physical infrastructure exists to support the clinical demands of the NCA required at these two facilities, and the need for additional facility infrastructure (not considering renovation) at WRAMC might not be necessary.

The long-term recommendation would be to build more military healthcare infrastructure in northern Virginia. I would recommend the renovation of the older DeWitt hospital to meet the ambulatory specialty and primary care needs of northern Virginia beneficiaries, while having the new DeWitt hospital focus on inpatient care.

The integration and sharing of resources with other military, VHA, and civilian healthcare systems is a strategic decision that could dramatically impact future military health facility construction projects in the NCA. By effectively integrating and realigning healthcare resources within the NCA, the MHS could potentially modify or eliminate current or future construction projects, thereby reducing the overall cost of these programs, while improving access to care and better meeting the clinical needs of the MHS beneficiary population.

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Appendix A

Glossary

Capital Assets – Assets that have a useful life greater than one year, such as property, plant, and equipment.

Direct Care – Care provided to TRICARE eligible beneficiaries at military medical treatment facilities.

Military Construction (MILCON) – Congressionally appropriated funds used to finance the repair or replacement of facilities, as well as for construction of facilities for new missions.

Plant Replacement Value (PRV) – The cost to replace an existing facility with a facility of the same size at the same location, using today's building standards.

Real Property - Land, including land improvements, and structures, but excluding movable machinery and equipment.

Appendix B

FY 2004 Overall Healthcare Demand for National Capital Area Military Healthcare Facilities

	FY 2004 SPECIALTY CARE APTS					FY 2004 PRIMARY CARE APTS					
MTF	VA	MD	DC	OTHER STATES	TOTAL	VA	MD	DC	OTHER STATES	TOTAL	
ABERDEEN	927	35062	133	11444	47566	109	12191	8	1815	14123	61689
ANNAPOLIS	851	43821	101	3741	48514	85	7670	12	526	8293	56807
ANNAPOLIS WALLOPS ISLAND	243	90	0		333	0	0	0		0	333
BMC BANCROFT HALL	804	36407	26	5974	43211	0	0	0		0	43211
BMC CARDEROCK	222	904	23	23	1172	0	0	0		0	1172
BMC DAHLGREN	13355	663	21	1370	15409	0	0	0		0	15409
BMC NAVAL AIR FACILITY ANDREWS	2237	5811	437	1143	9628	0	0	0		0	9628
BMC NAVAL RESEARCH LABORATORY	434	866	172	50	1522	0	0	0		0	1522
BMC WASHINGTON NAVY YARD	5155	3458	2951	1306	12870	0	0	0		0	12870
BOLLING	10328	3584	3682	2882	20476	848	1046	2666	592	5152	25628
DETRICK	610	24935	33	6410	31988	0	0	0		0	31988
DEWITT ACH	245955	7374	1567	23979	278875	53903	683	225	4719	59530	338405
DILORENZO TRICARE HC ARLG ANEX	6673	1343	589	1236	9841	0	0	0		0	9841
DILORENZO TRICARE HLTH CLN	62612	12464	3599	9926	88601	0	0	0		0	88601
FAIRFAX FHC	60526	423	131	3202	64282	33239	146	61	2087	35533	99815
KIMBROUGH ACC	3373	143748	588	16153	163862	151	19886	42	1953	22032	185894
MALCOLM GROW	36912	231842	13365	24322	306441	3583	32076	1315	2906	39880	346321
MCNAIR AHC	2311	587	507	530	3935	0	0	0		0	3935
NAVAL MEDICAL CLINIC QUANTICO	106837	1134	259	13273	121503	13509	53	10	1632	15204	136707
NNMC BETHESDA. MD	187429	279175	23352	53427	543383	25943	40898	2674	4911	74426	617809
PAX	1241	56887	88	4715	62931	66	5662	0	564	6292	69223
QUANTICO MARINE CORPS AIR FLD	1460	18	10	133	1621	0	0	0		0	1621
QUANTICO OFFICER CANDIDATE SCH	10979	1074	369	4248	16670	0	0	0		0	16670
QUANTICO THE BASIC SCHOOL	9775	741	28	2750	13294	0	0	0		0	13294
RADER USAHC	47522	3231	1472	3468	55693	11759	481	281	865	13386	69079
WALTER REED AMC	192929	249679	72831	142697	658136	27322	68634	19895	11572	127423	785559
WOODBRIDGE FHC	126269	440	204	7199	134112	32969	143	22	2189	35323	169435
TOTALS	1137969	1145761	126538	345601	2755869	203486	189569	27211	36331	456597	3212466

Source: Integrated Clinical Database (ICDB) data-pull obtained from Mr. Donald Kerr on January 19, 2005.

Appendix C

FY 2004 Tri-Region Healthcare Demand for National Capital Area Military Healthcare Facilities

MTF	FY 2004 SPECIALTY CARE APTS				FY 2004 PRIMARY CARE APTS				
	VA	MD	DC	TOTAL	VA	MD	DC	TOTAL	
ABERDEEN	927	35062	133	36122	109	12191	8	12308	48430
ANNAPOLIS	851	43821	101	44773	85	7670	12	7767	52540
ANNAPOLIS WALLOPS ISLAND	243	90	0	333	0	0	0	0	333
BMC BANCROFT HALL	804	36407	26	37237	0	0	0	0	37237
BMC CARDEROCK	222	904	23	1149	0	0	0	0	1149
BMC DAHLGREN	13355	663	21	14039	0	0	0	0	14039
BMC NAVAL AIR FACILITY ANDREWS	2237	5811	437	8485	0	0	0	0	8485
BMC NAVAL RESEARCH LABORATORY	434	866	172	1472	0	0	0	0	1472
BMC WASHINGTON NAVY YARD	5155	3458	2951	11564	0	0	0	0	11564
BOLLING	10328	3584	3682	17594	848	1046	2666	4560	22154
DETRICK	610	24935	33	25578	0	0	0	0	25578
DEWITT ACH	245955	7374	1567	254896	53903	683	225	54811	309707
DILORENZO TRICARE HC ARLG ANEX	6673	1343	589	8605	0	0	0	0	8605
DILORENZO TRICARE HLTH CLN	62612	12464	3599	78675	0	0	0	0	78675
FAIRFAX FHC	60526	423	131	61080	33239	146	61	33446	94526
KIMBROUGH ACC	3373	143748	588	147709	151	19886	42	20079	167788
MALCOLM GROW	36912	231842	13365	282119	3583	32076	1315	36974	319093
MCNAIR AHC	2311	587	507	3405	0	0	0	0	3405
NAVAL MEDICAL CLINIC QUANTICO	106837	1134	259	108230	13509	53	10	13572	121802
NNMC BETHESDA. MD	187429	279175	23352	489956	25943	40898	2674	69515	559471
PAX	1241	56887	88	58216	66	5662	0	5728	63944
QUANTICO MARINE CORPS AIR FLD	1460	18	10	1488	0	0	0	0	1488
QUANTICO OFFICER CANDIDATE SCH	10979	1074	369	12422	0	0	0	0	12422
QUANTICO THE BASIC SCHOOL	9775	741	28	10544	0	0	0	0	10544
RADER USAHC	47522	3231	1472	52225	11759	481	281	12521	64746
WALTER REED AMC	192929	249679	72831	515439	27322	68634	19895	115851	631290
WOODBRIDGE FHC	126269	440	204	126913	32969	143	22	33134	160047
TOTALS	1137969	1145761	126538	2410268	203486	189569	27211	420266	2830534

Source: Integrated Clinical Database (ICDB) data-pull obtained from Mr. Donald Kerr on January 19, 2005.

Appendix D

FY 2004 Workload for Patients Living in Virginia Stratified by Specialty Service for all National Capital Area Military Medical Treatment Facilities

FY04 WORKLOAD FOR PATIENTS LIVING IN VA BY SPECIALTY SERVICE FOR ALL MTFS

DIVISION_NAME	Total Of APPOINTMENT_DATETIME	CARDIOLOGY	DERMATOLOGY	GASTROENTEROLOGY	GENERAL SURGERY	GYNECOLOGY	NEUROLOGY	OPHTHALMOLOGY	ORTHOPEDIC	OTOLARYNGOLOGY	UROLOGY
ABERDEEN	927	0	0	0	20	0	0	0	0	0	0
ANNAPOLIS	851	0	0	0	0	0	0	0	23	2	0
ANNAPOLIS WALLOPS ISLAND	243	0	0	0	0	0	0	0	0	0	0
BMC BANCROFT HALL	804	0	4	0	1	0	1	0	136	3	0
BMC CARDEROCK	222	0	0	0	0	0	0	0	0	0	0
BMC DAHLGREN	13355	0	0	0	0	0	0	0	0	0	0
BMC NAVAL AIR FACILITY ANDREWS	2237	0	0	0	0	0	0	0	0	0	0
BMC NAVAL RESEARCH LABORATORY	434	0	0	0	0	0	0	0	0	0	0
BMC WASHINGTON NAVY YARD	5155	0	0	0	0	0	0	0	0	0	0
BOLLING	10328	0	0	0	0	596	0	0	0	0	0
DETRICK	610	0	0	0	0	0	0	0	1	0	0
DEWITT ACH	245955	5953	3437	4204	3460	14795	1063	3993	7552	1694	3844
DILORENZO TRICARE HC ARLG ANEX	6673	0	0	0	0	0	0	0	0	0	0
DILORENZO TRICARE HLTH CLN	62612	1354	1573	0	0	0	0	0	0	0	0
FAIRFAX FHC	60526	0	0	0	0	0	0	0	0	0	0
KIMBROUGH ACC	3373	6	8	42	435	25	0	138	223	30	66
MALCOLM GROW	36912	1311	1154	525	921	1102	342	909	1622	1967	1099
MCNAIR AHC	2311	0	0	0	0	0	0	0	0	0	0
NAVAL MEDICAL CLINIC QUANTICO	106837	0	366	0	0	60	40	129	0	211	0
NNMC BETHESDA. MD	187429	14072	11447	3730	7175	15238	4437	9803	5954	6980	4306
PAX	1241	0	0	0	0	46	0	0	1	0	0
QUANTICO MARINE CORPS AIR FLD	1460	0	0	0	0	0	0	0	0	0	0
QUANTICO OFFICER CANDIDATE SCH	10979	0	0	0	0	0	0	0	177	0	0
QUANTICO THE BASIC SCHOOL	9775	0	0	0	0	0	0	0	0	0	0
RADER USAHC	47522	0	374	0	0	2269	0	0	22	0	0
WALTER REED AMC	192929	15410	8891	9218	3794	8625	3403	10631	3460	4218	10986
WOODBRIDGE FHC	126269	0	0	422	0	2059	0	0	2418	0	0
TOTALS	**1137969**	**38106**	**27254**	**18141**	**15806**	**44815**	**9286**	**25603**	**21589**	**15105**	**20301**

SUM OF 10 SPECIALTY APPTS 236006 This total accounts for approximately 21% of all specialty appointments by Virginia residents in FY 2004.

= Facilities in the DeWitt Healthcare System (DHCS)

TOTAL DHCS APPTS 480272 This total accounts for approximately 42% of all specialty care appointments by Virginia residents in FY 2004.

Source: Integrated Clinical Database (ICDB) data-pull obtained from Mr. Donald Kerr on January 19, 2005.

Appendix E

2004 Medical Group Management Association Academic Practice Compensation and Production Survey Tables

Academic Table: Ambulatory Encounters (Over 67% Billable Clinical NPP Excluded) All Academic Faculty								
Specialty	**Faculty**	**Depts.**	**Mean**	**Std. Dev.**	**25th %tile**	**Median**	**75th %tile**	**90th %tile**
Cardiology: Noninvasive	48	12	2,841	3,137	682	1,484	3,968	8,184
Dermatology	18	8	2,907	1,678	1,940	2,690	4,023	5,003
Gastroenterology	47	14	1,305	924	563	915	2,003	2,485
Neurology	52	13	1,323	1,003	627	1,152	1,783	2,602
Ob/Gyn: Gynecology (only)	15	7	1,983	874	1,172	1,970	2,317	3,582
Ophthalmology	23	9	2,421	1,220	1,291	2,335	2,960	4,604
Ortho Surg: General	10	5	1,603	881	890	1,619	2,328	2,904
Otorhinolaryngology	34	8	1,603	603	1,231	1,642	2,016	2,332
Surgery: General	61	16	1,010	543	557	923	1,337	1,724
Urology	38	15	1,958	824	1,412	1,947	2,393	3,057

Academic Table: Standardized Ambulatory Encounters (100% Billable Clinical NPP Excluded) All Academic Faculty								
Specialty	**Faculty**	**Depts.**	**Mean**	**Std. Dev.**	**25th %tile**	**Median**	**75th %tile**	**90th %tile**
Cardiology: Noninvasive	71	15	3,012	3,582	741	1,704	3,689	8,768
Dermatology	32	12	4,436	2,240	3,195	4,209	6,076	7,374
Gastroenterology	65	14	1,836	2,034	784	1,230	2,450	3,030
Neurology	81	13	1,812	1,230	887	1,586	2,412	3,417
Ob/Gyn: Gynecology (only)	20	7	3,172	2,579	1,413	2,276	4,416	7,286
Ophthalmology	37	10	3,531	1,943	2,028	3,116	4,755	6,303
Ortho Surg: General	13	7	2,267	1,660	931	2,218	2,931	5,421
Otorhinolaryngology	46	9	2,316	1,466	1,577	2,064	2,496	3,318
Surgery: General	91	17	1,272	659	824	1,115	1,713	2,171
Urology	61	15	2,405	1,184	1,609	2,248	3,080	3,746

PCPS Table: Private Practice Physician Ambulatory Encounters All Physicians								
Specialty	**Providers**	**Practices**	**Mean**	**Std. Dev.**	**25th %tile**	**Median**	**75th %tile**	**90th %tile**
Cardiology: Noninvasive	263	85	2,935	2,092	1,679	2,374	3,629	5,484
Dermatology	180	85	5,928	3,333	4,116	5,385	6,906	8,744
Gastroenterology	452	131	1,655	822	1,080	1,501	2,106	2,720
Neurology	298	107	2,675	1,532	1,668	2,284	3,224	4,771
Ob/Gyn: Gynecology (only)	85	54	2,776	1,808	1,804	2,268	3,522	4,171
Ophthalmology	274	93	5,367	2,064	4,186	5,033	6,218	8,353
Ortho Surg: General	600	160	3,577	1,410	2,616	3,387	4,345	5,313
Otorhinolaryngology	247	103	3,852	2,837	2,743	3,347	4,382	5,656
Surgery: General	617	181	1,736	933	1,153	1,589	2,117	2,800
Urology	351	106	3,038	1,011	2,314	2,960	3,629	4,402

Appendix F

Physician Staffing Scenario Calculation Sheet Using 2004 MGMA Survey

Physician Workload Scenarios for DeWitt Hospital based upon FY 2004 Specialty Consult Data

SPECIALTY SERVICE	VA Demand	Private practice benchmark Wt avg.median visits / physician	Estimated Private Practice Physicans reqd to serve VA pop.	Private practice benchmark Mean visits / physician	Estimated Private Practice Physicans reqd to serve VA pop.	Academic practice benchmark (67% billable clinical activity.) Wt avg.median visits / physician	Estimated Academic Physicans reqd to serve VA pop. At 67% clinical activity	Academic practice benchmark (67% billable clinical activity.) Mean visits / physician	Estimated Academic Physicans reqd to serve VA pop. At 67% clinical activity	Academic practice benchmark (at 100% clinical activity) Wt avg.median visits / physician	Estimated Academic Physicans reqd to serve VA pop. at 100% clinical activity	Academic practice benchmark (at 100% clinical activity) Mean visits / physician	Estimated Academic Physicans reqd to serve VA pop. at 100% clinical activity
CARDIOLOGY (Non-invasive)	38106	2,374	16.05	2,935	12.98	1,484	25.68	2,841	13.41	1,704	22.36	3,012	12.65
DERMATOLOGY	27254	5,385	5.06	5,928	4.60	2,690	10.13	2,907	9.38	4,209	6.48	4,436	6.14
GASTROENTEROLOGY	18141	1,501	12.09	1,655	10.96	915	19.83	1,305	13.90	1,230	14.75	1,836	9.88
GENERAL SURGERY	15806	1,589	9.95	1,736	9.10	923	17.12	1,010	15.65	1,115	14.18	1,272	12.43
GYNECOLOGY	44815	2,268	19.76	2,776	16.14	1,970	22.75	1,983	22.60	2,276	19.69	3,172	14.13
NEUROLOGY	9286	2,284	4.07	2,675	3.47	1,152	8.06	1,323	7.02	1,586	5.85	1,812	5.12
OPHTHALMOLOGY	25603	5,033	5.09	5,367	4.77	2,335	10.96	2,421	10.58	3,116	8.22	3,531	7.25
ORTHOPEDIC (General)	21589	3,387	6.37	3,577	6.04	1,619	13.33	1,603	13.47	2,218	9.73	2,267	9.52
OTOLARYNGOLOGY	15105	3,347	4.51	3,852	3.92	1,642	9.20	1,603	9.42	2,064	7.32	2,316	6.52
UROLOGY	20301	2,960	6.86	3,038	6.68	1,947	10.43	1,958	10.37	2,248	9.03	2,405	8.44
TOTAL	236006		**89.80**		**78.67**		**147.50**		**125.79**		**117.61**		**92.09**
			96 Providers		83 Providers		153 Providers		131 Providers		123 Providers		98 Providers

NOTE 1: All workload benchmarks from 2004 MGMA Academic Practice Compensation and Production Survey unless otherwise noted

NOTE 2: Physician staffing levels determined by dividing the total demand for visits into the various median and mean benchmarks for visits.

NOTE 3: Provider requirements were rounded up when determining staffing requirements.

Appendix G

Department of Defense Space Planning Criteria for Health Facilities

GYNECOLOGY (WOMEN'S HEALTH) PATIENT AREAS				
Screening/Weights and Measures (GP)	EXRG4	7.43	80	Minimum up to four projected FTE providers. One additional room for increment of four providers.
OB/GYN Exam Room (GP)	EXRG8	11.15	120	Two per projected FTE provider minus one isolation exam room.
Isolation Exam Room (GP)	EXRG6	13.01	140	One per clinic.
Isolation Exam Toilet	TLTU1	4.65	50	One per clinic
Consult room	OFDC2	11.15	120	One per clinic.
Patient/Specimen Toilet (GP)	TLTU1	4.65	50	Minimum one. Provide two toilets if projected FTE providers is between nine and fifteen. Provide three toilets if projected FTE providers is sixteen or more with a maximum of three toilets.
Specimen Lab/Holding	LBOB1	5.57	60	One per women's clinic when no laboratory technician (FTE) projected.
Satellite Lab	LBSP1	11.15	120	One, if one or more laboratory technician (FTE) projected.
Bone Densitometry Room	XDBD1	11.15	120	One, if in the clinic concept of operations.
Infertility Fluoroscopy Room (GP)	XDRF1	27.87	300	One, if in the clinic concept of operations.
Fluoroscopy Toilet (GP)	TLTF1	4.65	50	One per programmed fluoroscopy room.
OB/GYN Treatment Room	TROB1	16.26	175	One per six providers.
Colposcopy Room	TROB1	16.26	175	If in the clinic concept of operations.
Ultrasound Room (GP)	XDUS1	15.33	165	One per dedicated ultrasound unit.
Ultrasound Toilet (GP)	TLTF1	4.65	50	One per two ultrasound rooms. Round up from 0.4.
Non-Stress Test / Fetal Monitoring (GP)	OPST1	11.15	120	If in clinic concept of operations. One station.
Non-Stress Toilet (GP)	TLTF1	4.65	50	One per Non-Stress room.
Mammography (GP)	XDM01	11.15	120	One per dedicated mammography unit.
Mammography Film Processing (GP)	XDMP1	10.22	110	One for every five-mammography units programmed.

CARDIOLOGY CLINIC Cardiology and pulmonary clinics may be separate clinics at larger facilities. Must have a minimum of two FTE cardiologists projected.				
PATIENT AREAS – CARDIOLOGY CLINIC				
Adult Screening Room (GP)	EXRG4	7.43	80	One per every four providers.
Pediatric Screening Room	EXRG5	7.43	80	One per clinic.
Patient Education Room	LIBV1	11.15	120	One per clinic.
Cardiology Exam Rooms (GP)	EXRG1	11.15	120	Army - Two per projected FTE. (Also note resident examination rooms.)
	EXRG2			Navy. (See above planning range comments.)
	EXRG3			Air Force/VA. (See above planning range comments.)
EKG Testing (GP)	OPEC1	11.15	120	Minimum. Total number of rooms may be more. See formula in Section 3.16.6.
EKG Work Area and Records	OPEC2	11.15	120	Minimum. One per clinic, add 10 nsf for each EKG room in excess of one.
Stress Echocardiograph Room	OPPE2	18.58	200	*One per Cardiology clinic, if required*
Echocardiograph Room	OPPE1	13.01	140	One room per every 1000 echoes performed annually.
Echocardiograph Reading Room, 2 station (GP)	XVC02	11.15	120	One room per every two echocardiograph rooms.
Echocardiograph Records Storage Room	MRS01	9.29	100	One per clinic. Provide an additional 40 nsf if records are not maintained on CD or video format.
Transesophageal Echocardiograph. Room	OPPE1	20.44	220	One per clinic if in clinic concept of operations. May collocate with Cardiac Cath. Area.
Recovery Area (GP)	RRSS3	11.15	120	One per transesophageal echo. room.
Scope Wash Room (GP)	USCL2	9.29	100	One per transesophageal echo. room.
Ultrasound (GP)	XDUS1	15.33	165	One, if in clinic concept of operations and if qualified technician or qualified physician (FTE) projected.
Tilt Table Testing (GP)	OPTM2	11.15	120	One per clinic.
Pacemaker, ICD Interrogation	OPPM1	11.15	120	One per clinic.
Pacemaker Equipment Storage	SRE01	5.57	60	One per pacemaker room.
Treadmill (GP)	OPTM1	20.44	220	Minimum of one per Cardiology clinic when cardiologist is programmed. Provide second room when more than 1,000 echoes performed annually.
Toilet with Shower	TLTS2	6.50	70	One per two diagnostic rooms (treadmill or echo).

Dressing Room/Cubicle (GP)	DR001	4.65	50	Minimum per cubicle. One cubicle per Phonocardio, one per Echocardiography Room, and one per Treadmill room.
PATIENT AREAS – CARDIOLOGY CLINIC Continued				
Holter Monitor Room	OPHM1	11.15	120	One per Cardiology clinic if FTE cardiologist is projected.
Holter Monitor Equipment Room	SRE01	9.29	100	One per Holter Monitor Room.
Patient Toilet (GP)	TLTU1	4.65	50	One if number of projected FTE providers is between three and eight. Provide two toilets if number of projected FTE providers is between nine and fifteen. Provide three toilets if number of projected FTE providers is sixteen or more with a maximum of three toilets.

CARDIAC CATHETERIZATION (CATH) LAB Must have a minimum of one cardiologist FTE projected, can be located in Radiology Department.				
X-ray, Cardiac Cath Exposure (GP)	XCCE1	54.81	590	Per room authorized.
Patient Prep/Recovery Cubicle (GP)	ORPP1	11.15	120	Two per Cardiac Cath room.
Nurse Station, Minimal	OFA01	5.57	60	Minimum if four or less beds
Nurse Station (GP)	NSTA4	11.15	120	If greater than four beds
Scrub Area (GP)	ORSA1	5.57	70	For two scrub sinks
Control Room (GP)	XCCC1	22.30	240	Minimum. Add 80 nsf per exposure room over one.
Viewing Room	XVC01	9.29	100	One per two exposure rooms
Equipment Storage	SRS01	12.54	135	Minimum one per two exposure rooms
Sterile Supply	ORCW 1	9.29	100	One per two exposure rooms
Cardiac Cath Instrument Room	XCCI1	9.29	100	One per exposure room
Cardiac Cath System Component Room (GP)	XCCA1	12.54	135	One room for two exposure rooms.
Equipment Cleanup	ORDA 1	7.43	80	Minimum, One per two cardiac catheterization rooms

Source: http://tricare.osd.mil/rm/mflcm_criteria.cfm